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Jonthan Freund's group at UCLA has continued their work identifying and modeling jet noise mechanism in supersonic and subsonic jets using first-principles computations. While such simulations are naturally limited in Reynolds number, the results show excellent agreement with experiments and are uniquely suited to study the physics because they provide full space- and time-resolved flow field data along with the acoustic field. In collaboration with Tom Bewley at UCSD, these same databases are now also being used to develop jet noise control strategies. A new simulation of the near-nozzle region of a jet is also underway which complements ongoing jet shear layer noise experiments being conducted by Mo Samimy's group at Ohio State to identify the flow mechanism that lead to particularly noisy events.

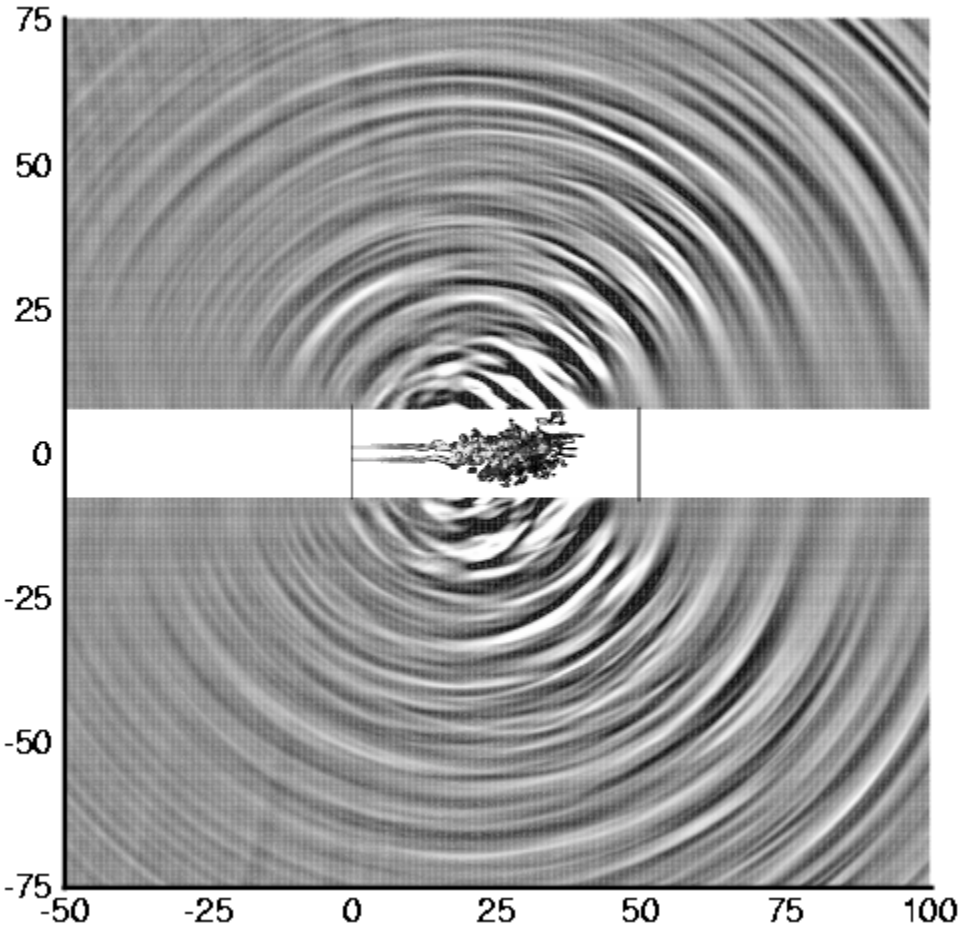

Figure 1. Visualization of a round jet first-principles simulation. The jet turbulence is visualized with contours of vorticity magnitude and the noise is visualized with gray-scale levels of divergence of velocity. The vertical lines demark the extent of the Navier-Stokes computational domain, the right third of which is an absorbing boundary zone.